

The Spiritual Brain: Intimations or Hallucinations of God?

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Abstract: *Do mystical experiences make it rational to believe in God? A fair number of theistic philosophers have thought so, and, for the mystic who is ignorant of current scientific findings, perhaps that conclusion is correct.¹ But the ignorant are not best qualified to judge: let us see how science might inform judgment. Here I will focus most particularly on the neurological basis of mystical experiences (MEs). It might initially seem that the evidence for such a basis is theologically benign—neutral on the question whether MEs may reasonably be considered veridical perceptions of the divine. I shall argue that this is a mistake.*

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Causal Mechanisms: Sense Perception vs. Mystical Experience

Faced with the growing body of evidence that distinctive neural processes mediate ME, a theist will naturally be inclined to observe that ordinary perceptual experience is also so mediated. Why expect ME to be any different? Short of embracing radical skepticism, we presume in favor of the deliverances of our senses. A similar presumption should be accorded to MEs. In neither case is the presumption vitiated by lack of knowledge of the neural mechanisms, or even by failure to understand that there *are* such mechanisms, or that things going well perceptually depends upon things going well neurally. It is acknowledged on all hands, to be sure, that a finding of significant malfunction in the relevant mechanisms may undermine the evidence they seem to deliver.

¹ See e.g., Wainwright, *Mysticism*; Alston, *Perceiving God*; Yandell, *The Epistemology of Religious Experience*; and Gellman, *Experience of God and the Rationality of Religious Belief*. Others include Broad, “Arguments for the Existence of God,” 157–67; Hick, “Mystical Experience as Cognition”; Swinburne, *The Existence of God*, 293–327; Gutting, *Religious Belief and Religious Skepticism*; and Davis, *The Evidential Force of Mystical Experience*.

This, in its broadest outline, is a common theistic argument. Whatever the relationship between brain processes and conscious states generally, it should come as no surprise that MEs are similarly related to a neural substrate. That goes no distance toward showing that MEs are not perceptual experiences of God. The theme that an ME is a type of perceptual experience that has good *prima facie* epistemic credentials has been elaborated within the framework of a variety of theories of perception, though not generally with attention to neurophysiological findings.

But it should occur to one that there is a potential challenge to a theistic understanding of MEs that is raised by such findings. In the case of ordinary sense perception—visual or auditory perception, for example—we know of a neurological basis, and we are beginning to understand something of the way in which the relevant brain circuits process signals from the eyes and ears. But we know more: we know in some detail how the eyes and ears themselves are stimulated by physical things—light and sound—that carry in their form the imprint of those parts of the environment from which they originate: the objects seen and heard. We know, in short (mainly by using these very sensory modalities, among others) how information about the objects of perception is transmitted, via sense organs, to the brain. To be explicit: we have a growing body of empirical findings and theory that explain sense perceptions and the conditions under which they are dependable, that indicates how ordinary sense experiences provide a basis for informed judgments about the physical world, how and why our sense organs must be abetted in various ways to extend the range of features of our environment that we can investigate, and so on.² Moreover, the discoveries we make through the use of any one sensory modality can be (and regularly are) confirmed by the deliverances of other sensory modalities. All of this, taken as knowledge of ourselves, relies, of course, upon the general veracity of the senses. So as not to beg any questions here, we may observe that, although we have no non-sensory access to sensory mechanisms, and no non-sensory basis for judgments of reliability, we do nevertheless find, remarkably enough, that all of our evidence—our ordinary perceptual judgments, empirical findings concerning the structure and function of our

² I do not mean to suggest that all this has allowed us to make much progress with the *deep* mind/body questions—e.g., the problems of *qualia* and of intentionality. But that shortcoming, though a deeper understanding of the brain may ultimately play a role in helping us rectify it, is not a weakness for my present case. All that case requires is the recognition that the pervasive and detailed correspondences between brain activity and mental processes confirm the essential role that the production of brain states plays in the production of mental states, and hence the essential explanatory relevance of facts about the operations of the brain.

sensory mechanisms, physical theory, and input from all the sensory modalities—can be fit together into a single, highly coherent picture of our perceptual environment, and our perceptual relations to it.³

We now are beginning to understand the neurological episodes that underlie theistic MEs (hereafter, TMEs) as well; but we are not similarly able to trace the causal ancestry of those episodes to God—or to any supernatural thing whose character can independently be ascertained to be reflected in the experiences these episodes generate.⁴ Indeed, although the causal ancestry, at the physical level, of MEs is largely unknown in detail, what is known suggests a purely physical explanation for the brain activity that generates mystical consciousness. I shall flesh this out shortly. But first, we should observe that the threat posed by this circumstance is an instance of a general sort of way in which hypotheses can be disconfirmed.

The mystic no more ordinarily thinks of God's presence as the *explanation* for his or her ME than the casual birdwatcher thinks of the presence of the bird as the explanation for his or her bird-experience. Both just take themselves to perceive the respective objects, however distinctive the respective perceptual modalities may be. Nevertheless, it seems indisputable that unless the presence of a bird is causally responsible for the bird-experience—unless, therefore, it figures in the right way in the explanation of that experience—it won't be the case that a bird is being perceived. And similarly, *mutatis mutandis*, the mystic won't be perceiving God unless God's "presence" or activity causally explains the mystic's experience in the right way.

Non-Veridicality and Alternate Explanations of Experience

To ascertain what a perceiver perceives on a given occasion is to determine what, if anything, is in the right way causally responsible for the perceptual experience. God might in *some* way be causally responsible for *any* experience—for example, if he created the birder and the bird—but that won't

³ This fact, taken by itself, does not provide much ammunition against radical skepticism concerning the senses. But here we need to "bracket" that kind of skepticism and assume that we have the ordinary sort of empirical knowledge, in order to examine the relevance of neurophysiology to the epistemic *bona fides* of mystical experiences.

⁴ Nor are there procedures *within* mystical practice comparable to those that permit one sense experience to corroborate another. See Fales, "Mystical Experiences as Evidence," 19–46.

be enough for the experience to count as spotting God.⁵ So someone who claims to have good all-things-considered reasons to think he perceives *X* is committed to thinking that *X*'s standing in the "right" causal relation to his experience is the best explanation for his having that experience.⁶ To the extent, therefore, that there exist *alternative* credible explanations of a phenomenon—here a perceptual experience—the favored hypothesis loses some strength.⁷

In his *Dialogues Concerning Natural Religion*, for example, one of the important strategies Hume uses to undermine the argument from design is to proffer alternative explanations for the orderly features of the universe. In "Of Miracles" and his lesser-known *Natural History of Religion*, he directs the same strategy against religious belief itself. In the latter, for example, he astutely points to the evidence for polytheism among early peoples, and the lack of evidence for monotheism, and goes on to suggest how such early beliefs might have arisen. Aboriginal polytheism is not easy to account for by anyone who takes seriously and more or less literally the Genesis story of creation. To the extent that Hume's own naturalistic account provides a better explanation, it damages, in this arena at least, Christian orthodoxy.

This strategy does not establish the falsity of the theistic hypothesis, but it is effective in diminishing its credibility, to the extent that one or more non-theistic alternatives can explain the phenomena under examination as well as, or better than, the theistic hypothesis can.

Two important comments are in order. First, the credibility of a hypothesis depends not only upon its ability to explain the data it is directly invoked to explain, but upon how well it coheres with other well-confirmed hypotheses—hence, with the data *they* are invoked to explain.⁸

⁵ Just what sort of causal relation *does* count is a vexed question I shall have to set aside here. In most cases, we have enough practical wisdom to make correct judgments about this, philosophical niceties aside.

⁶ Perhaps there is a (defeasible) presumption that, if I seem to see *X*, then *X*'s standing in the required relation to my seeing is the best explanation for the visual experience. I do not myself accept such a principle of credulity, but will allow it for present purposes.

⁷ This argumentative strategy is regularly employed by skeptics. How *severe* the theft of probability from the favored hypothesis is depends upon the character, scope, and number of the competing hypotheses proposed by the skeptic. Because it is no part of my present purpose to stir up the weapons of radical or global skepticism, I shall be arguing, in a much more limited and ordinary way, that naturalistic explanations of MEs not only diminish the strength of the naïve theistic way of understanding their cognitive import, but indeed undermine that understanding by providing a better one.

⁸ Thus, the fact that Newtonian physics could not easily be reconciled with Maxwell's electromagnetic theory constituted a serious difficulty for both theories.

Second, the credibility of a hypothesis need not be diminished by the explanatory success of another hypothesis bearing upon the same data, if the two hypotheses are not incompatible. In particular, it may sometimes be possible to combine two hypotheses. Specifically with respect to *causal* hypotheses, this can occur in two ways relevant here. First, a hypothesis H_2 may supplement a hypothesis H_1 by fleshing out H_1 's causal story; i.e. by filling gaps in that story. Second, though perhaps improbably as a rule, both H_1 and H_2 may explain an event when the occurrence of that event is causally overdetermined. When adding one hypothesis to another does nothing by way of increasing explanatory power (but also nothing to diminish it), I will say that the added hypothesis is "tacked on" or "rides piggy-back" on the one that does the explanatory work.⁹ One can, for example, invoke gap-filling hypotheses "on the cheap" by positing some novel causal factor without having any independent reason to think that such a factor can, or does, play the kind of causal role assigned to it. Such an addition would not be accompanied by any increase in explanatory power.

A response of this "tacking-on" sort is available to Hume's challenge concerning early forms of religion. A theist can point out that the sands of time have covered the early history of the human species. For some tens of millennia between the advent of *Homo sapiens* and the time when written records open a window upon the religious life of ancient peoples, the remnants of human cultures provide almost no insight into the development of religious beliefs.¹⁰ So it remains open to theists to postulate an era in which the earliest human beings were in intimate converse with the God of Abraham, only later to fall away into idolatry, polytheism, and the like. The trouble with this maneuver—a paradigm example of God-of-the-gaps theology—is that everything we do know about early civilizations militates against it, while it plays no role in explaining independently ascertainable facts about human nature or history. If that is right, then a Garden of Eden is at best a gratuitous addition to what archeology has to teach us about early forms of religious worship.

⁹ There can be degrees to which an add-on hypothesis enhances or diminishes explanatory power. A fair principle is that, other things being equal, an add-on that diminishes explanatory power should be eschewed. There is also potential for considerable complexity in how explanatory work gets shared or divided among hypotheses that are conjoined to provide an account of a given range of phenomena. These complications can be largely ignored in the present case.

¹⁰ The few cave paintings, clay and stone figurines, and the like support only speculative guesses about these matters.

The Neurophysiology of Mystical Experience

The topic of this paper is the compatibility of neurophysiological explanations of MEs with the view that MEs—at any rate some MEs—are experiences of God. First we must summarize the neurophysiological findings. The realization that the neural basis of ME was accessible to investigation was an accident. The distinguished neurosurgeon Wilder Penfield, operating on conscious patients with severe epilepsy, discovered that electrode stimulation of the temporal lobes of the brain could produce powerful experiences of a recognizably mystical character. Subsequent investigations, employing EEG recordings and PET and SPECT brain scans of meditating subjects, have isolated the regions of the brain that are active (or unusually quiescent) during ME.

A major finding is that MEs often involve abnormal excitations of the limbic system (the temporal lobes), including the amygdala, the thalamus, the hippocampus, and the cingulate gyrus. Efforts have for some time been underway to understand the phenomenology of MEs in terms of the functions of the brain loci that are implicated in these experiences, their interactions, and the nature of the excitations they undergo.

Here I shall try to indicate the general character of these efforts by briefly summarizing the account offered by d'Aquili and Newberg of the mechanisms that lead to and underlie what they call the state of absolute unitary being (AUB). This they characterize as

... a state in which the subject loses all awareness of discrete limited being and of the passage of time, and even experiences an obliteration of the self-other dichotomy....if AUB is experienced, accompanied by blissful positive affect, it is usually interpreted as the *unio mystica*, or the experience of God. If it is associated with neutral or tranquil affect, it is more frequently interpreted as the void or Nirvana of Buddhism¹¹

D'Aquili and Newberg consider two pathways to AUB, one initiated by passive meditation, the other by active, or focused meditation. For our purposes, it will be sufficient to describe the hypothesized feedback processes that are thought to generate AUB's. These involve excitations and blocking of input occurring between the Attention Association Area (AAA), Orientation Association Area (OAA), hippocampus, and amygdala.

¹¹ d'Aquili and Newberg, *The Mystical Mind*, 109–10.

In the d'Aquili/Newberg model, passive meditation, which tries to clear the mind of all thoughts, reduces input to the right AAA, which in turn partially blocks input to the right OAA. (The OAA processes information concerning orientation in space, spatial relations, and the boundaries between the self and surroundings. It also determines whether something is within reach or at more than arm's length.) This partial deafferentation of the right OAA stimulates the right hippocampus, which in turn stimulates the right amygdala. The latter responds by stimulating the right hippocampus further. If this positive feedback loop leads to strong enough hippocampal stimulation, a "spillover" circuit is opened which results in the hippocampus maximally inhibiting input to the right AAA. This, in turn, totally deafferentates the right OAA. Spillover from the right AAA also leads to total deafferentation of the left AAA and OAA. When the right and left OAAs are totally deafferentated, the phenomenological effect is loss of spatial orientation and of the very sense of spatial relations; further, distinctions between self and other, and between what is within one's grasp and what is not, vanish. Thus, one has a sense of "merging" with everything.

Under these conditions, the right and left hippocampi stimulate arousal structures of the sympathetic nervous system or quiescent structures of the parasympathetic nervous system, which in turn further stimulate the amygdala. What I want to draw attention to here is the facts that the brain loci that are involved have known functions that, in the light of the kind of stimulation or deafferentation they experience during AUB, can help us understand the phenomenology of these MEs. I have already mentioned the role of the OAA's. We may add, by way of more general clues, that the amygdala plays a major role in controlling and mediating emotions and motivation. It allows us to discern, and to express, such emotions as love, fear, and anger. It has extensive connections to the cognitive and sensory areas of the brain. The hippocampus, in turn, has a central role in information processing, memory, learning, attention, and other cognitive functions. The hippocampus closely interacts with the amygdala. These two loci, which partially comprise the limbic system in the brain, are known to be hyper stimulated during MEs.

Such excitations are, when they become sufficiently severe, commonly associated with temporal lobe epilepsy. Not all epileptics have MEs, but the incidence is much higher than in "normal" populations; many epileptics are also obsessed with religious ideas and rituals. Mystics who are not epileptic

nevertheless have been shown to register protoepileptic seizures of the temporal lobes when they are having MEs.¹²

These findings are significant for two reasons. First, the brain loci involved function as a kind of “crossroads” processing system that takes input from memory, cognitive centers, perceptual areas, and emotional coding and integrates these in ways central to basic survival behaviors: fighting, fleeing, feeding, and sex. Second, the seizures that produce MEs involve *abnormal* activity in these organs—activity that, when strong enough—is associated with mental disease. These two facts, taken together, have allowed neurologists to explain some of the major features of MEs. For example, while we are not close to reading off the cognitive content of a ME from its neural substrate, we can explain why MEs *do* often have cognitive content, and specifically, content heavily influenced by a subject’s understanding of his or her cultural and religious context. For the limbic system has available to it information stored in memory and that being processed by the cognitive centers.¹³ Moreover, it comes as no surprise that MEs are typically accompanied by powerful emotional affect, as the limbic system mediates emotional response. Third, the blocking of input during certain types of MEs to the superior posterior parietal lobe, which processes spatial and body-orientation information suggests why perceptions of space and of the distinctness of the self become distorted in those MEs. Fourth, the fact that certain repetitive stimuli can trigger ME-producing seizures explains the efficacy of certain trance-inducing religious rituals. This is only a brief synopsis of some of the ways in which the specific features of the neurophysiology of MEs can explain both some of their culture-independent, universal features and those features that clearly import cultural information.¹⁴

¹² See Trimble, “Epilepsy and Hyperreligiosity” or Ramachandran and Blakeslee, *Phantoms in the Brain*, 174–98, for a nontechnical summary.

¹³ On the activation of cognitive areas of the brain during MEs, see Azari, “The Cognitivity of Religious Experience and Emotion.” The cognitive dimensions of MEs are crucial for explaining the sensitivity of ME content to cultural context. Azari’s findings suggest that, in her subjects, there was no activation of the limbic system. However, it is unclear whether her subjects self-induced mystical consciousness or some other kind of religious state. There is also evidence that hyperreligiosity does not—or does not invariably—accompany temporal lobe epilepsy. But again, this does not exclude the possibility that (certain kinds of) ME have a temporal-lobe epileptic etiology. Nor is it clear how closely mystical experience is associated with hyperreligiosity. In general, we must bear in mind that the entire field is – both at the experimental level and at the theoretical level – still in its infancy; our conclusions must accordingly be tentative.

¹⁴ For a much more detailed explanatory framework, see d’Aquili and Newberg, *The Mystical Mind*.

Thus the neurophysiological study of MEs, while still in its infancy, gives considerable support to the following thesis:

N: The empirical features of MEs are explained by recognizable malfunctions in systems of the human brain, often associated with certain kinds of physical stimulation. N leaves it open whether God is involved in the ultimate etiology of TMEs in a way that suffices for their being experiences of God (call this hypothesis T). Thus, it is formally open to the theist to piggy-back a theistic understanding of such MEs onto N. But how plausible is such a maneuver?

The Price of Piggy-Backing Theism

Electrode stimulation is of course not the only way in which mystical experiences can be artificially induced.¹⁵ The most familiar technique is ingestion of psychedelic compounds. Concerning that method, William Wainwright has argued that

... there appears to be no reason why God should not have ordained hallucinogens, or anything else whose use is not intrinsically immoral, as a means of grace.¹⁶

As Robert Oakes, to whom Wainwright is responding, has pointed out however, it is implausible that, like the genie in Aladdin's lamp, God can be bidden to appear at the whim of human beings.¹⁷ Yet—as Wainwright is well aware—there are well-known *religious* techniques for inducing trance and calling forth the Spirit. One can observe some of these at any Pentecostal service. It is surely more reasonable to conclude that *all* these techniques call forth experiences that are hallucinatory—and, indeed, that spontaneous MEs are hallucinatory as well, insofar as they involve a mystical presentation of God.

A theist might respond by allowing that *some* theistic experiences—perhaps the artificially induced ones—are hallucinatory, whereas others are

¹⁵ A non-invasive alternative method uses a helmet which generates magnetic fields that induce currents in the brain that can trigger MEs.

¹⁶ Wainwright, *Mysticism*, 76.

¹⁷ Oakes, "Biochemistry and Theistic Mysticism," 10–16. R.C. Zaehner is even more dismissive of psychedelic MEs (see Zaehner, *Drugs, Mysticism, and Make-Believe*, 79, where Zaehner calls those who put chemical "trips" on a par with those of Christian mystics "ignorant fools"). It's hard to imagine a more knock-down argument than that. The question of a typology of MEs is a complex and vexed question I shall have to set aside here.

not.¹⁸ But how are we to tell, then, which are and which are not? After all, even if all psychedelic and surgically induced experiences are hallucinations, why can't some spontaneous ones be as well? And what are we to say of *religious* techniques used to induce trance, from meditation to the wild dancing of Sufi mystics or voodooists (and, in some cultures, ingestion of psychotropic drugs)? To be sure, mystics from various traditions have offered criteria for discriminating between genuine and delusory experiences. But their criteria are often tradition-bound, and appear to be tendentious, question-begging, or irrelevant.¹⁹ Indeed, it is hard to see how they could fail to be, since theists have no idea how God influences the mystic's mind, and hence no way of independently certifying these criteria.

The problem of distinguishing veridical from delusive MEs—call it the discrimination problem—generalizes. I have no space here to describe the panoply of forms—spirit possession, shamanic trance, visions, auditions, astral projection, intuitions of presence, etc.—mystics understand their experiences to take. Nor is there time to detail the vast menagerie of items that inhabit ME: deities, demi-gods, saints, demons, angels, ancestors, animal spirits, nothingness, being itself, and the rest. However, this variety presents the theist with the problem of explaining why TMEs should be privileged as veridical, while many non-theistic ones should not.

In spite of the unconvincing criteria that religious mystics themselves have offered, perhaps there are some intrinsic, phenomenal characteristics that distinguish veridical TMEs from non-veridical MEs. But what might these be? If we take artificially induced MEs (such as those Michael Persinger has produced in experimental subjects through magnetic stimulation of the limbic system) to be non-veridical, for instance, we can see how unpromising the search for such a phenomenal indicator must be. Many of Persinger's subjects report feeling "a presence," and some report seeing God, or Jesus, or the like. For example, one of these subjects, who reports having spontaneous experience of the presence of Mary or Jesus, described an experimentally induced sudden "feeling," and even a visual presence of Christ. Even atheists who have tried on

¹⁸ Thus Zaehner, *Drugs, Mysticism, and Make-Believe*, 79. Zaehner does concede that some psychedelic experiences might be *phenomenologically* indistinguishable from veridical MEs.

¹⁹ Concerning one such set of criteria—those offered by the famous Reformation mystic Teresa of Avila—see Fales, "Mystical Experiences as Evidence," 19–46. Similar—and equally question-begging—criteria were offered by Protestant thinkers such as Jonathan Edwards and John Wesley who were attempting to combat what they saw as the delusions of religious "enthusiasm" while insisting upon legitimate religious experiences (see Taves, *Fits, Trances, & Visions*).

Persinger's helmet report a sensed presence or out of body experiences, comparable to drug-induced experiences.²⁰

Alternatively, one might suppose that veridical TMEs are ecstatic, joyful, and the like, whereas merely pathological MEs are fearful or otherwise unpleasant. But that suggestion won't do either. Not only are many of the putatively non-veridical MEs—those experienced by pagan shamans, drug-induced or helmet-induced hallucinations, and the like often powerfully positive, but the MEs of paradigmatic theistic mystics are not uncommonly fraught with fear, anxiety, and the like. We need only recall such experiences as the one reported by Teresa of Avila, in which Jesus came to her and sought to transport her bodily into heaven; Teresa was terrified of the prospect.²¹

Mysticism: One Thing or Many?

One of the strengths of a purely naturalistic/neurological explanation of MEs in this connection is that it suggests how to resolve a running dispute between Steven Katz and Robert Forman (and others) over whether MEs are culture-dependent and irreducibly diverse or fall into a small number of universal types.²²

Katz has argued that MEs are permeated through and through by the religious traditions, conceptual categories, imagery and iconography of the mystic's home religion and cultural background.²³ Katz's claim is not that the cultural coloration of MEs arises when "pure" experience is subsequently interpreted in terms of familiar religious categories, but rather that these

²⁰ Persinger, "Experimental Simulation of the God Experience," 282–83.

²¹ Teresa of Avila, chap. 20, 1–7. Otto, *The Idea of the Holy*, provides a classic description of this aspect of religious experience, mystical and otherwise, with numerous examples.

²² See e.g., Katz, *Mysticism and Philosophical Analysis*; and Forman, *Mysticism, Mind, Consciousness*.

²³ One might reply, in the style of Herbert H. Farmer's objections (see Farmer, *Towards Belief in God*, chap. 9) to Durkheim's explanation of religion as an unconscious projection of social realities, that mystics are often religious and cultural innovators, whose experiences are not mere copy-cat reproductions of culturally given conceptions. This way with Katz will not cut very deep. Katz can easily reply—as Durkheim could have—that the theory makes allowance for innovation: innovation that can only be understood, however, against the background of existing tradition, social problems that exert pressure upon existing cultural forms, and plausible strategies for effecting reform. The much deeper point of Katz's critique of ME is that it always—indeed inescapably—reflects culturally shaped, and therefore particularistic, cognitive processes. It is not a raw, conceptually innocent, unprocessed presentation of the "given."

categories permeate, and shape, the phenomenology of MEs themselves. As against this, Forman defends the “perennial philosophy,” the view that at the core of mystical traditions across the religious spectrum, there are certain recognizably identifiable types of ecstatic phenomenology that are, if not universal, at least not culturally determined. In this, Foreman is defending an approach to the study of MEs that has a long scholarly history.²⁴

Katz’s defense of his position is situated within the broader framework of a kind of culturally relativized neo-Kantian epistemology reminiscent of Durkheim’s. All thought, and even our perceptual experience itself is, according to this view, shaped by culturally given ways of conceiving the world. But we need not accept that epistemological theory (which I think is ultimately incoherent) in order to find serious merit in Katz’s emphasis on the variegated and particularistic content of mystical traditions. It is undeniably true that mystics understand and describe their experiences in ways that are deeply informed by, and interwoven with, the religious worldviews of their respective cultures, and these often exhibit dramatic differences.

The natural explanation of the correlation between a mystic’s experiences (at least as they are described) and cultural expectations is that these antecedent expectations, which are known by the mystic, play a role (via brain processes) in the generation and character of the religious ecstasies of the mystic. It is far less plausible to claim that these episodes involve veridical perception of a world of spirits, for mystics themselves, and their co-religionists, will want to insist that while some MEs are veridical—no doubt those favored by their religious convictions—others are either a snare and a delusion, or else genuine perceptions of demonic beings misidentified as holy. The problem this presents to the faithful is that of supplying non-question-begging, plausible criteria for distinguishing the divine and the delusional.²⁵

At the same time, there is strong evidence for Forman’s position that there are significant, recognizable commonalities that transcend cultural differences. Among the features that appear to be relatively culture-independent are, for example, profound changes in affect—e.g. deep feelings of harmony and peace, a sense of the loss of boundaries that separate the self from others, the world, or the divine, a sense of communion with the divine, and a feeling of

²⁴ The cross-cultural comparison of MEs, with an eye to discovering universal features or a general typology, goes back at least to William James and includes such major figures as Rudolph Otto, *The Idea of the Holy* and R.C. Zaehner, *Drugs, Mysticism, and Make-Believe*.

²⁵ This difficulty is explored at greater length in Fales, “Scientific Explanations of Mystical Experiences,” 297–313, where I compare the explanatory force of theism and a sociological theory in the light of the facts about cultural variation.

being emptied of, or freed from, ordinary cares, desires, and the like. Can we make sense of these apparently conflicting aspects of mystical phenomenology: the particularistic and the universal? Can they be reconciled? I suggest they can be, and in particular, that current neurophysiological models point toward a natural explanation of both features.

The neurophysiological account suggests that we should expect *both* variety—because of the way culture can enter into mystical content via information from memory and cognition—and certain common phenomenologies—e.g., distortion of space and time, absence of self or union of self with other, and so on.²⁶ Theists can explain the veridicality of TMEs by claiming that their content is influenced by a *correct* cognitive set, but that simply postpones the issue: what non-question-begging criteria determine correct cognitive set?

How to Tell the Real Thing

The discrimination problem raises a question. Are there any relevant *phenomenological* differences between spontaneous (and preferably, veridical) mystical experiences and those that are artificially induced? Or are there artificially induced experiences that, had they been spontaneous, would have been taken as paradigm theistic experiences? Even if the answer to the latter question is ‘no,’ the underlying neurophysiology supports the conclusion that artificial experiences *could* phenomenologically duplicate paradigmatic spontaneous theistic ones. For the neurophysiology supports N, and N entails the possibility of convincing hallucination.

That prompts another question. Why, if God communicates through MEs, did he not so design the human brain as to be incapable of generating such experiences by itself or under the influence of natural stimuli, and then himself generate them *directly*, without the mediation of any brain mechanisms or processes at all? That would have eliminated the possibility of mistake in this most important channel of contact between God and his creatures.²⁷

²⁶ Again, see Azari, “The Cognitivity of Religious Experience and Emotion.”

²⁷ One will be reminded of Philonous’ arguments against Hylas in Berkeley’s *Three Dialogues Between Hylas and Philonous*, near the middle of the Second Dialogue, where Philonous points out that God would have no need of the instrumentality of material substances to produce sensory ideas in us. Though Philonous’ argument has little force when directed against material substances (in part because of Descartes’ point that this would make God into a deceiver after all), the parallel argument is much more telling in the present context.

There is a final point. The “Reformed epistemology” of Alvin Plantinga and others holds that beliefs—including properly basic beliefs—are warranted if they are produced by cognitive mechanisms successfully designed to aim at the truth, functioning properly in a congenial environment.²⁸ He claims, further, that Christians see their basic creedal beliefs as ones produced through the operation of a *sensus divinitatis* and by the indwelling of the Holy Spirit—hence by belief-producing mechanisms of the warrant-producing kind. What evidence is there for the existence of these mechanisms? For Calvin, the evidence of the former is an alleged universal tendency of human beings to recognize the existence of God. Calvin was perhaps not as fully apprised as we are of the multitude of non-theistic, even atheistic, religious traditions. But *many* Christians have taken MEs to provide the most direct and dramatic evidence for the indwelling of the Holy Spirit. Here, however, we do well to remember that MEs seem to be the product of the *malfunctioning* of the limbic system—and therefore, not warrant-conferring.

Perhaps such terms as ‘malfunction’ will seem tendentious to the theist. Or, at least, they will seem tendentious when used to describe the mystical saints of his own religion. But first, the cross-cultural similarities of certain central features of MEs suggest (though few data yet exist) that the same disturbances of these brain loci characterize the mystical states of those pagan mystics who our theist may be inclined to describe as demon-possessed or deluded. (The pagan will, no doubt, be content to repay the compliment.)

Second, and more importantly, there is nothing tendentious about the judgment of malfunction. The proper functioning of the limbic system is well enough understood to allow such judgments to be objectively made. The suggestion that the normative evaluation is mistaken or must be relativized to some religious system is hard to take seriously. That epileptic and psychotic brains are brains gone awry is surely not a merely “cultural” fact, even if different cultures understand and treat these conditions differently.

Mysticism as Malfunction

Against the view that MEs are produced by abnormally functioning limbic systems, several arguments may however be offered. First, it may be pointed out, correctly, that many mystics have led vigorous, flourishing lives and have found in their MEs an immense source of strength. Indeed, so far from being abnormal, worshippers in Pentecostal poisonous-snake-handling

²⁸ Plantinga adds a couple of other conditions that do not affect the present point.

churches in the Southern Appalachian region of the U.S. score higher than normal on some mental health scales.²⁹ Second, various authors have argued that, because MEs can play a beneficial role in human life, the capacity for generating MEs must have evolved through natural selection as a natural function of the brain's hard wiring. Third, it can be pointed out that a biological system, such as the limbic system, may subserve several quite distinct functions, and that what appears as abnormal behavior or malfunction from the perspective of one such aim may constitute proper functioning when understood as directed toward the achievement of another. This is especially true of a complex organ such as the brain, which clearly is adapted to perform a multitude of tasks.³⁰

Let us consider these objections in order. First, then, what of the evidence that MEs are a source of strength and that mystics often lead normal, healthy lives? Two initial points are in order. One, already noted, is that ME-generating temporal-lobe episodes are typically *mild* seizures, which are not—provided they are not precursors of more intense disturbances—debilitating or indicators of mental illness. The second is that the lives of mystics, including some of the most notable, are with rather striking frequency characterized by serious illness, often during late youth, that is commonly associated with the onset of MEs and with other crisis-induced changes in the emerging mystic's career.³¹ It is often unclear, moreover, in the case of earlier mystics, whether the illnesses in question are purely physical or whether a modern diagnosis would classify them as mental.

²⁹ See Gerard, "The Serpent-Handling Religions of West Virginia," 22–28. Gerard employed the Minnesota Multiphasic Personality Inventory. For an excellent discussion of the issue of mental health in this population with further references, see Burton, *Serpent-Handling Believers*, 126–37. Burton—rightly, I think—rejects the Freudian analysis of Weston La Barre, *They Shall Take Up Serpents*, which sees snake handling as a psychopathology. However, the applicability of this case to the general study of ME is unclear. Serpent handlers indeed do not take up poisonous snakes (or drink strychnine or lye, or handle fire) unless they are "anointed"—i.e. have gone into a trance state (whose physical and psychological manifestations they variously describe). On the basis of blood sample analysis of one worshipper, Schwartz, *Serpents, and Fire*, 53–66, infers that the anointing is a hypnotic state; further study would be required to reveal whether it involves excitation of the limbic system. Matters are further complicated by the fact that, here and in many other cases, there are confounding factors: MEs serve to validate an individual in the eyes of peers, are socially valued, and serve to enhance group identity. All of these may contribute significantly to mental well-being.

³⁰ I am grateful to John Bengson for alerting me to this consideration and for helpful comments.

³¹ The list of known cases of famous mystics includes, among others, Teresa of Avila, Julian of Norwich, Hildegard von Bingen, Margery Kempe, and arguably, Francis of Assisi, George Fox, and Muhammad, who, according to tradition, experienced a fearful state of mental collapse upon the occasion of his first revelations.

Mystics do not all descend into mental illness, though many do and many who enter only the antechambers of that labyrinth must struggle heroically to escape the dark night of insanity. They commonly see themselves as afflicted, as the “victims” of ecstasy, and the theme of descent, struggle, and rescue into renewed life is a common and powerful element of their therapeutic ministry to those whose lives they touch.³²

We are presented, then, with a range of cases. On the one end, we have individuals who experience occasional MEs, often spontaneous, which may provide a source of strength and which, if they are religious, may be interpreted as having religious significance. At the other end of the spectrum are those afflicted with serious mental disturbances. In between, we find mystics—often “career mystics”—who give evidence of having struggled with psychological affliction and having successfully achieved an adequate measure of control and stability.

These observations do not undermine the claim that MEs are generated by abnormal, indeed incipiently pathological, brain processes. Rather, they support that claim.³³ There is no denying that MEs can function as a powerful source of strength, inner peace, and the like. But we should remember, first, that they can do so for theists and non-theists alike. Theists will be much readier to see pagan MEs as aberrations (if not demonic) than their own, even if benign or beneficial by neutral measures; if so, they can hardly appeal to these features as indicative of a well-ordered mental condition.

Second, a non-debilitating malfunction can, sometimes quite by accident, have beneficial effects under certain conditions. A famous example is the hemoglobin mutation that produces sickle-cell anemia, a condition that impairs oxygen transport in the blood but also confers resistance to malaria. The trait tends, therefore, to be conserved in malaria-infested regions. The modified hemoglobin is, nonetheless, an impairment (indeed, fatal to those who carry both copies of the recessive gene).

This brings us to the second main objection to the claim that MEs involve brain malfunction. Several philosophers have attempted to analyze the notion of function—and, by extension, of malfunction—in terms of the

³² That no less a figure than St. Paul had this kind of self-understanding is obscurely hinted at in II Cor. 12.

³³ Sometimes abnormality is associated with special abilities—e.g. in autistic idiot savants, and in some instances of genuine genius. But it would be one thing for a deity to create abnormality-related intellectual gifts, another for Him to link spiritual gifts to psychopathology.

evolutionary history of an organism.³⁴ I am not concerned here with the success or failure of these attempts as *analyses* of (mal)function in living organisms, but with the suggestion that the adaptive advantages served by features of an organism provide a good criterion or guide for determining what purposes those features serve, and hence, when, through failure properly to achieve those ends, they may be judged to be malfunctioning.

It might, then, be urged that MEs confer adaptive benefits upon those that have them, and that therefore the brain mechanisms that generate them are not malfunctioning when they undergo the required processes. Several authors have, indeed, suggested as much, often by way of offering naturalistic explanations for religious belief.³⁵ On this view, the limbic system is functioning *properly* (or at least not improperly) when it generates MEs (at least under suitable conditions): for on the hypothesis, that is a capacity that was favored by natural selection. The argument can move in two directions. Either, it might be supposed, MEs help the experiencer cope with the stresses and uncertainties of life, and are in this way beneficial, or, more indirectly, they serve to generate or fuel commitment to religious beliefs and practices, which are in turn held to increase fitness by, e.g., promoting solidarity in human societies.

We do not know enough about human evolution—and in particular, about the development of religious beliefs—to rule out this possibility. But there are three considerations that make this line of reasoning rather doubtful. First, it is not known whether, or in what way, MEs may have played a role in the original creation of religious belief systems. We have abundant evidence that MEs are typically religiously interpreted by a mystic *after* his or her religious tradition has provided categories for such interpretation. Even when a mystic is a religious pioneer, we find that the categories in terms of which he or she understands the content of his or her MEs must be understood by reference to the cultural context.

Second, it is at best not at all clear that the distribution and frequency of occurrence of MEs in human populations is—or was at the time when the limbic system evolved the structures that make MEs available—sufficient to make MEs, even if they confer survival value, sufficiently significant for the operation of selective pressures. And third, it is entirely unclear whether MEs,

³⁴ E.g., Dretske, *Naturalizing the Mind*; and Millikan, *White Queen Psychology and Other Essays for Alice*.

³⁵ See, e.g., Alper, “The Evolutionary Origins of Spiritual Consciousness,” 293–304. For an overview of this approach to understanding religion, see Boyer, *Religion Explained*, 135–54.

even if they now serve to fortify mystics in times of duress, would originally have had beneficial effects. Certainly we may assume they are not beneficial when they are associated with psychopathology, or with proneness to mental instability.

But even when they confer serenity or some other benefit, MEs may still be considered to involve brain malfunction. Consider, for example, deafferentation of the parietal lobes, which results in the characteristic loss of sense of self and of the boundaries between self and world. Harmless enough: provided the altered state is fleeting and the environment free of threat. But a recipe for trouble for an ancestor on the African veldt whose daily business required a sharp lookout for pitfalls and predators. Among the *primary* functions of the brain's mediation of spatial judgments is to provide an awareness of the embodied self in relation to threats and opportunities—e.g., food and safe haven. It is these functions that are disabled during those MEs that obliterate spatial distinctions (and, similarly, temporal judgments). But might the disablement of these functions enable the parietal lobes to perform some other useful function during MEs?

This brings me to the third major objection. This objection begins with the observation that a single system may serve two or more functions for an organism. Set to perform function F_1 , system S may be ill-equipped to perform alternative function F_2 , and vice versa. But that does not show that S is malfunctioning when it performs the one function or the other. Rather, we can only say that S is malfunctioning if it is performing F_2 when it should be performing F_1 or is being employed to perform F_1 while on the F_2 setting.

Here are two analogies involving human artifacts. A Swiss Army knife, with the screwdriver blade extended, is an adequate tool for driving screws, but ill-suited for uncorking bottles. With the corkscrew in play, it serves the latter purpose but cannot drive screws. It is designed to do both, but not at once. That is one case.

Here is another. The toaster is misbehaving; it no longer makes toast efficiently. Casting about for some alternative to disposal, I discover that it makes an excellent cage heater for my tropical reptiles. Call this an opportunistic function.

Some biological systems perform several functions at once (e.g., the mammalian circulatory system); some must switch modes (legs, moving one way, serve the purpose of walking; moving another, the purpose of climbing). New functions can emerge opportunistically via natural selection, sometimes with diminished performance of prior functions (as in conferral of resistance to

malaria in sickle cell anemia), sometimes not (as in the evolution of some locomotor cilia from cell-wall transport mechanisms³⁶).

A naturalistic explanation of MEs can, of course, help itself to any of these possibilities; naturalism is not committed to the view that MEs are generated by malfunctioning brains, even if the associated religious beliefs are taken to be delusional. But the theist will be under some pressure to insist that, as a generator of (veridical) TMEs, the limbic system in the brain is analogous to the Swiss Army knife. Generating such experiences, in certain circumstances, is one of its proper functions, one that does not involve neural malfunction.

That conception of TMEs seems unavoidable for the Reformed epistemologist who wishes to appeal to such MEs as providing warrant for theistic beliefs. But any theist, of whatever epistemological persuasion, should find uncomfortable the suggestion that generation of MEs is an opportunistic function of the limbic system, whether of the toaster type (which involves a malfunction), or whether it simply is a capacity developed in virtue of some chance (but lucky) mutation. For it hardly seems likely that God would rest the possibility of communicating with some of His creatures upon a brain design arrived at in those ways.

What, then, is the likelihood that the Swiss Army knife analogy is the correct one? This is not, as just noted, a make-or-break issue for the naturalist, who can accept that analogy, in view of the speculative, but not entirely implausible, ways in which natural selection might favor a predisposition, in some portion of a population, to focal limbic system discharges that generate MEs. The fact that this proportion of the population is quite small (at least for experience of “full-blown” TMEs), and that many of the other functions of the limbic structures are much more central to competent behavior, strongly suggests that generation of such MEs cannot have been a primary factor in the evolutionary selection of limbic system structures. But the very fact that such discharges are similar to, and can easily degenerate into, psychopathology, makes the naturalistic/evolutionary account *more plausible*, at face value, than a theistic account, *even if* it is conceded that the limbic system need not be malfunctioning when it generates MEs. Unless theists can provide some explanation for why God would choose as a vehicle for communication with humans a brain process that is fraught with this danger, the reasonable supposition is that the process does not exist by divine design.

³⁶ See Musgrave, “Evolution of the Bacterial Flagellum,” 72–84.

Conclusion

Here, then, is the state of play. The evidence suggests, first, that N is correct: MEs are naturalistically explained by malfunctions of the limbic system. But even if generation of MEs can be regarded as *a* proper function of human limbic systems, it involves the incapacitation of other functions—in fact, of those functions that the limbic system (and parietal lobes) primarily evolved to serve. From the perspective of those primary functions, therefore, the mystically engaged limbic system is not functioning well. These considerations, taken together with the fact that the content of MEs is heavily influenced by cultural context (hence that the mystical function of the brain is evidently not dedicated to theistic experience), and that God could—presumably would—not have held communication with humans hostage to the vicissitudes to which brain processes are subject, all argue in favor of a purely naturalistic explanation, even if it be granted that N is false.

Theists will, of course, want to suggest that, if God so designed the human limbic system as to make it receptive, under certain conditions, to communications from him, then that system is functioning properly under those conditions when a TME occurs. Fair enough: but here we are considering whether MEs provide independent evidence for the existence of God, and for that purpose, it won't do to affirm the proper functioning of the brain under these circumstances on the basis of an assumed divine design. All we may properly appeal to is the mundane evidence we have for that claim.

We may conclude that the theistic understanding of (theistic) MEs adds nothing to the explanatory resources of the neurophysiological understanding of them. Worse, piggy-backing the claim of veridicality for (some) such experiences is not explanatorily benign. It makes it *more difficult* to explain some of the mystical phenomena that the naturalistic approach explains. In short, that MEs are mediated by limbic processes that are either abnormal or secondary, often associated with psychopathology, and just as likely to support non-theistic beliefs as theistic ones, is *less* probable given N and T than on N alone. To be sure, theistic piggy-backing might still be justified if theism were strongly supported on independent grounds. But it is beyond the purview of this paper to consider that question.

BIBLIOGRAPHY

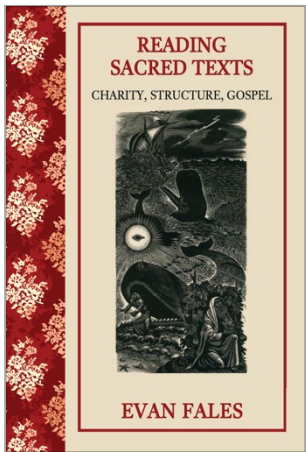
- Alper, Matthew. "The Evolutionary Origins of Spiritual Consciousness." In *NeuroTheology: Brain, Science, Spirituality, Religious Experience*, edited by R. Joseph, 293–304. San Jose, CA: University Press, 2002.
- Alston, William P. *Perceiving God: The Epistemology of Religious Experience*. Ithaca, NY: Cornell University Press, 1991.
- Avila, Teresa of. "Life." In *The Collected Works of St. Teresa of Avila*, Translated by K. Kavanaugh and O. Rodriguez. Vol. I. Washington, D.C.: ICS Publications, 1976.
- Azari, Nina P. "The Cognitivity of Religious Experience and Emotion: Evidence from Neuroimaging." In *Brain–Religion–Experience: Multidiscipline Encounters*, edited by C. Jäger. New York: Springer, forthcoming.
- Boyer, Pascal. *Religion Explained*. London: William Heinemann, 2001.
- Broad, C.D. "Arguments for the Existence of God, II." *The Journal of Theological Studies* 40, (1939): 157–67.
- Burton, Thomas. *Serpent-Handling Believers*. Knoxville, TN: University of Tennessee Press, 1996.
- d'Aquili, Eugene, and Andrew B. Newberg. *The Mystical Mind: Probing the Biology of Mystical Experience*. Minneapolis, MN: Fortress Press, 1999.
- Davis, Caroline Franks. *The Evidential Force of Mystical Experience*. Oxford: Clarendon Press, 1989.
- Dretske, Fred I. *Naturalizing the Mind*. Cambridge, MA: MIT Press, 1995.
- Fales, Evan. "Scientific Explanations of Mystical Experiences: The Challenge of Theism." *Religious Studies* 32, (1996): 297–313.
- . "Mystical Experiences as Evidence." *International Journal for Philosophy of Religion* 40, (1996): 19–46.
- Farmer, Herbert H. *Towards Belief in God*. London: Student Christian Movement Press, 1942.
- Forman, Robert K.C. *Mysticism, Mind, Consciousness*. Albany, NY: SUNY Press, 1999.
- Gellman, Jerome. *Experience of God and the Rationality of Religious Belief*. Ithaca, NY: Cornell University Press, 1997.
- Gerard, Nathan L. "The Serpent-Handling Religions of West Virginia." *Trans-Action* 5, (1968): 22–28.
- Gutting, G. *Religious Belief and Religious Skepticism*. Notre Dame.: Notre Dame University Press, 1982.
- Hick, J. "Mystical Experience as Cognition." In *Mystics and Scholars: The Calgary Conference on Mysticism, 1976*, edited by H. Coward and T. Penelhum. Waterloo, Ont.: Wilfrid Laurier University Press, 1977.
- Katz, Steven. T. ed. *Mysticism and Philosophical Analysis*. New York: Oxford University Press, 1978.

- La Barre, Weston. *They Shall Take Up Serpents: Psychology of a Southern Snake-Handling Cult*. New York: Schocken Books, 1969.
- Millikan, Ruth Garrett. *White Queen Psychology and Other Essays for Alice*. Cambridge, MA: MIT Press, 1993.
- Musgrave, Ian. "Evolution of the Bacterial Flagellum." In *Why Intelligent Design Fails*, edited by T. Edis, 72–84. New Brunswick, NJ: Rutgers University Press, 2004.
- Oakes, Robert A. "Biochemistry and Theistic Mysticism." *Sophia* XV, (1976): 10–16.
- Otto, Rudolf. *The Idea of the Holy: An Inquiry into the Non-Rational Factor in the Idea of the Divine and Its Relation to the Rational*, 2nd ed. Translated by John W. Harvey. London: Oxford University Press, 1950.
- Persinger, M. A. "Experimental Simulation of the God Experience: Implications for Religious Beliefs and the Future of the Human species." In *Neurotheology: Brain, Science, Spirituality, and Religious Experience*, edited by R. Joseph, 279–92. San Jose, CA: University Press, 2002.
- Ramachandran, V. S., and Sandra Blakeslee. *Phantoms in the Brain: Probing the Mysteries of the Human Mind*. New York: Quill, 1998.
- Schwartz, Scott W. *Faith, Serpents, and Fire: Images of Kentucky Holiness Believers*. Jackson, MS: University Press of Mississippi, 1999.
- Swinburne, Richard. *The Existence of God*. Oxford: Oxford University Press, 1979.
- Taves, Ann. *Fits, Trances, & Visions: Experiencing Religion and Explaining Experience from Wesley to James*. Princeton, NJ: Princeton University Press, 1999.
- Trimble, M. "Epilepsy and Hyperreligiosity: The Contribution of Neurological Disorders to an Understanding of Religious Experiences." In *Brain–Religion–Experience: Multidiscipline Encounters*, edited by C. Jäger. New York: Springer, *forthcoming*.
- Wainwright, William J. *Mysticism: A Study of its Nature, Cognitive Value and Moral Implications*. Madison, WI: University of Wisconsin Press, 1981.
- Yandell, Keith E. *The Epistemology of Religious Experience*. New York: Cambridge University Press, 1993.
- Zaehner, R.C. *Drugs, Mysticism, and Make-Believe*. London: Collins, 1972.

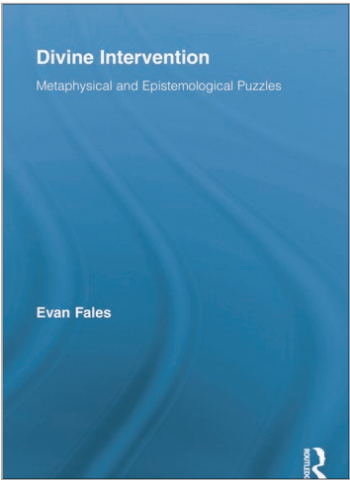
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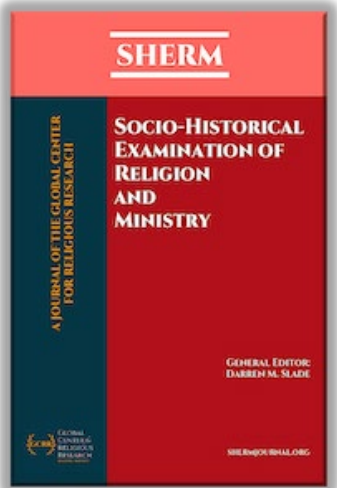
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